Composting in Austria

**...the decentralised Solution**

**Mixed Waste Composting ???**

**Development of Separately Collected Biowaste**

**Organic Fraction in the Residual Waste**

**Quality as a Result of Source Separation - a Clear Picture**

**Four Key Elements of the Waste Management Act**

- Compost Ordinance .... The 1st END of WASTE Regulation ! Sept 2001
- Mixing of not listed and approved materials is prohibited !
The Austrian Compost Ordinance .... (Sept. 2001)
- Positive list & compliance test for input materials
- Quality requirements linked to application areas
- Regular quality approval, sampling and analytical methods
- Product certification by external control bodies
- Requirements for quality assurance systems
- Labelling and recommendations for the proper use
- Record keeping and comprehensive documentation
- Central registration at the Ministry for Environment

Compost is a Product

Heavy Metal Limits for Compost

<table>
<thead>
<tr>
<th></th>
<th>Cd</th>
<th>Cr</th>
<th>Cu</th>
<th>Hg</th>
<th>Ni</th>
<th>Pb</th>
<th>Zn</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECO Farming</td>
<td>0.7</td>
<td>70</td>
<td>0.4</td>
<td>25</td>
<td>45</td>
<td>200</td>
<td>1</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1</td>
<td>70</td>
<td>150</td>
<td>0.7</td>
<td>69</td>
<td>120</td>
<td>500</td>
</tr>
<tr>
<td>Landscaping</td>
<td>3</td>
<td>250</td>
<td>500</td>
<td>3</td>
<td>100</td>
<td>200</td>
<td>1800</td>
</tr>
</tbody>
</table>

Capacity and Number of Composting Plants 1999/2000

<table>
<thead>
<tr>
<th>Capacity classes [t a⁻¹]</th>
<th>Count</th>
<th>Capacity [t a⁻¹]</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=5000</td>
<td>25 %</td>
<td>60,000</td>
</tr>
<tr>
<td>2000 - 5000</td>
<td>40 %</td>
<td>120,000</td>
</tr>
<tr>
<td>500 - 2000</td>
<td>20 %</td>
<td>70,000</td>
</tr>
<tr>
<td>50 - 500</td>
<td>5 %</td>
<td>15,000</td>
</tr>
<tr>
<td>0 - 50</td>
<td>10 %</td>
<td>5,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>250,000</td>
</tr>
</tbody>
</table>

Figures on Separate Collection and Composting

- Number of Composting plants: 479
- Capacity: 975,000 t f.m. y⁻¹
- Treatment: Total Bio- & Green Waste: 600,000 t f.m. y⁻¹
- Total Throughput: 165,000 Tonnes y⁻¹
- Treatment per Inh.: 138 kg y⁻¹

Compost Associations in Austria

- Industrial Composting Plants: 300,000 t, 13 plants
- Agricultural Composting Plants: 280,000 t, 350 plants

Agricultural Composting in Lower Austria

- Inhabitants: 1.2 Mil.
- Number of Composting plants: 81
- Total Throughput: 165,000 Tonnes y⁻¹
- Treatment per Inh.: 138 kg y⁻¹
- Agricultural Composting Plants: 47
- Total Throughput: 85,000 Tonnes y⁻¹
- Compost produced: 50,000 Tonnes y⁻¹
- Compost use: 75% Agriculture, 25% other uses
- Registration Fee: 400 €
- Membership Fee: 0.15 € t⁻¹
**Ranges of Income**

| Treatment fee |  
|----------------|----------------|
| Biowaste       | 40 – 50.-- € per t |
| Green waste    | 0 – 50.-- € per t  |

**Composting in Austria**

**Compost Consulting & Development**

**Dipl.Ing. Florian Amlinger**

**European Compost Network / ECN**

**QAS of the Agricultural Composting Association**

- CONTROLLING
  - Obligations of the Austrian Compost Ordinance
  - 1 – 4 Sampling and Analyses
  - Compost Quality
  - Compost Use
  - Check of Records
    - Licence, Materials, Quantities, Process Control
  - Changes of Management & Process

- ADVISE
  - Technical Equipment
  - Process Control
  - Quality Management
  - Recommendations for Compost Use (legal limitations & options)

**Ranges of Income**

| Compost Price                |  
|------------------------------|----------------|
| Fresh, large quantities     | 5.-- € per m³ |
| Agriculture                  |                |
| Mature, fine, small          | 20.-- € per m³ |
| quantities                   |                |
| Blends & Substrates          | 20 – 40.-- € per m³ |

**INPUT:**

- BIOWASTE
- GREEN WASTE
- CEMETARY WASTE

**DIMENSION:**

- 7,000 m²
- 750 m² under roof

**2 Organic Farmers... Partners of the Municipality**

**Screening and Separation Device**

**Collection truck for biobins**

**Self constructed turning machine**

**INPUT:**

- BIOWASTE
- GREEN WASTE
- CEMETARY WASTE

**DIMENSION:**

- 7,000 m²
- 750 m² under roof
The Graz Model

**Step 1: Pre-Treatment**

- **Screening & Separation**
- **Mixing & Homogenisation**
- **Transport**

**The Graz Model... The Contract**

- Preparation of organic biowaste and green waste mixtures
- Take over & composting of a defined quantity (+/- 5%) of pretreated organic biowaste and green waste mixtures
- Sampling and analyses
- Take back of sorted impurities (1.2% m/m)
- Take back of low quality compost (< Class ‘A’)

**The Graz Model**

<table>
<thead>
<tr>
<th>Inhabitants</th>
<th>Total</th>
<th>Households</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,750</td>
<td>7,388</td>
<td>786</td>
<td>2,716</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24%</td>
</tr>
</tbody>
</table>

**Collection Tour**

- 10 km to 63 biobins per week

**Composting Plant**

- Built by the Waste management Association
- Size 4,800 m²
- 40% financed by public funds

**Machinery**

- Collection truck: Municipality
- Windrow turner: Farmer
- Shredder: On demand hired by the Waste management Association

**Fees**

- Collection: 26.65 €/hour
- Biowaste: 25.07 €/m³ (~ 33 €/t)
- Green Waste: 5.23 €/m³ (~ 15 €/t)

**Use of Compost**

- Municipality: ~ 40%
- Organic Farms: ~ 60%

**The Graz Model**

**Step 2: Delivery & Composting**

- Servus Abfall Farmer
- Take back of sorted impurities (1.2% m/m)
- Take back of low quality compost (< Class ‘A’)
- Full responsibility for technology and process
- Records according to "Compost Ordinance"
- Take over only of “Quality Compost” (< Class ‘A’)

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<tr>
<td>1,750</td>
<td>7,388</td>
<td>786</td>
<td>18,000 t</td>
<td>4,000 t</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4,950 kg Ca⁻¹ y⁻¹</td>
<td>400 kg Ca⁻¹ y⁻¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>111,000</td>
<td>145,600</td>
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**The Graz Model**

**Step 3: Treatment**

- Screening & Metal & Wind separation, mixing
- Sampling and analyses
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**Recycling in AUSTRIA**

- Inhabitants: 238,000
- Households: 106,000
- Biowaste: 18,000 t
- Green Waste: 4,000 t
- Total: 26,000 t

**HH with Bio Bin**

- 77%

**HH with Home Composting**

- 15%
- 16%

**Number of Farms**

- 18

**Input per Farm**

- 200 – 3,000

**Composting fee (2003)**

- Biowaste: 31.4 € t⁻¹
- Green waste: 11.3 € t⁻¹

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The Graz Model ... QM

- 4 external inspections per year on each farm
  - Check of records, materials and quantities
  - Process control
- 1 external sampling and full analyses per year according to the Compost Ordinance

Home Composting is a Question of Motivation

Composting in Austria

Home composting

- As much individual home composting as possible (top priority!)
- Separate collection of organic waste where individual composting is not feasible
- As many decentralised plants as possible - favouring agricultural composting plants
- As few regional plants as necessary

The Strategy

As much individual home composting as possible (top priority!)
Separate collection of organic waste where individual composting is not feasible
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